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This
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Vol. 33, No. 1

APR 29 1954

Bartow, Florida

January, 1952



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Citrus Insect Control

For January 1952

R. M. PRATT AND W. L. THOMPSON
FLORIDA CITRUS EXPERIMENT
STATION, LAKE ALFRED

Both rust mite and purple mite infestations were increasing rapidly at the time this was written and these mites are expected to be a problem all through January. Purple mites are particularly damaging during the winter months because of the heavy leaf drop they may cause. Rust mites may also cause leaf drop if they are abundant, and "greasy spot," which is associated with rust mites, will also cause premature leaf drop.

Six-spotted mites are now being found in a few groves. In January these mites may be found most easily around purple scale colonies and on common sprouts under the trees.

Purple scale infestations are declining generally and have not been a serious problem in most groves during the fall months. However, in some groves they have been numerous enough to cause fruit drop, and where medium to heavy infestations occur in January they should be controlled.

Red scale infestations are now declining after the worst fall build-up of recent years. This scale can build up rapidly on new growth, so moderate to heavy infestations should be controlled during January, or before new growth starts.

Growers should be alert for mealy bug activity during January. The white, cottony egg masses may be found on the trunks. The fruits, especially those originating from late bloom, should be examined for mealy bugs.

January is the month to start the year on a successful pest and disease program suited to the area and to the variety of citrus to be treated. Dormant sprays for Temple oranges in all areas should include a copper compound for scab control. Copper should also be included in the dormant spray for scab control on grapefruit where it is prevalent in the Bradenton, Sarasota and east coast areas. Zinc and manganese compounds for nutritional purposes are often included in the dormant spray but they can be included in the post-bloom spray if it is not practical to use them in the

dormant application. Purple mite should also be controlled during the dormant season to prevent leaf drop as well as to reduce the infestation to a lower level so that the spring flush of growth will not become heavily infested while the leaves are in a succulent state of growth. Rust mites should be controlled in all groves to prevent russetting of the fruit and to prevent the occurrence of greasy spot on the leaves. Purple and red scale should be controlled where medium to heavy infestations exist.

Dormant application of a suitable miticide aids materially in reducing subsequent build-up of six-spotted mite. While it is too early to know if they will be a serious problem in 1952, the possibility presents an additional reason for the dormant application of DN.

It is fortunate that there are fungicides and insecticides that can be used in a combination spray to control all of the above diseases and insects.

For scale and mealy bug control, parathion at 1 to 1 2/3 pounds per 100 gallons is recommended in combination with any or all of the neutral compounds of copper, zinc and manganese used for fungicidal and nutritional purposes.

Parathion is also compatible with wettable sulfur and with all of the miticides used for purple mite con-

trol. If parathion is included in the spray mixture the spray should be applied during calm weather. Parathion is more effective during warm weather, and it should not be applied unless the temperature is expected to be up to 60 degrees or higher during the day, since the higher the temperature the more effective it is. Wherever possible, apply the spray after the crop has been picked to insure more thorough coverage, especially where scale control is necessary. In areas where low temperatures are not a factor and where the crop of fruit is well colored an oil emulsion spray applied just before the spring flush of growth is very effective in controlling scale and purple mite. A dormant copper-oil is also practical for the combined control of scab, scale and purple mites.

For detailed information on combination sprays it is urged that the grower refer to the 1951 or 1952 "Better Fruit Program." All necessary materials for the dormant applications and the dilutions of the materials are listed under Formula 1 in the Spray Schedule. For information not included in the Spray Schedule consult the Citrus Experiment Station at Lake Alfred or the Indian River Field Laboratory at Fort Pierce.

Now is the time to harvest scrap metals from Florida farms.

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* Written December 22, 1951. Reports of surveys by Harold Holtsberg, Co-coa; J. W. Davis, Tavares; K. G. Townsend, Tampa; J. B. Weeks, Avon Park; and E. D. Harris, Jr., Lake Alfred.



36,000 Boxes Oranges From This 12-Acre Grove in the Last 6 Years

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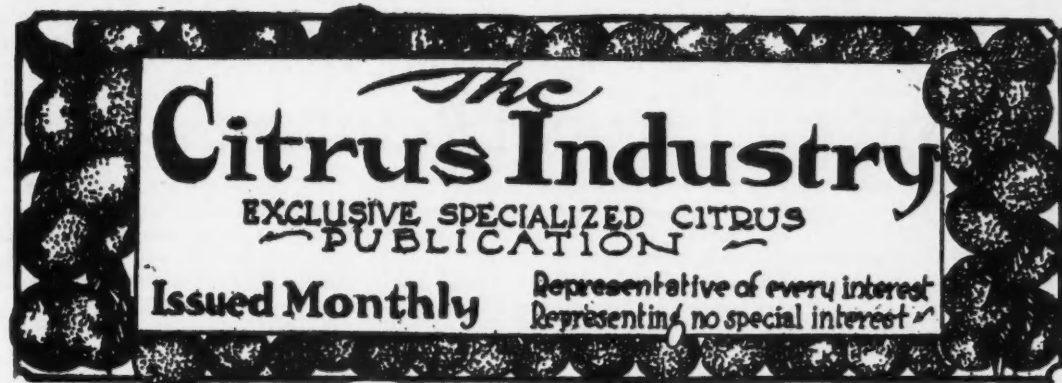
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Cachexia, A Bud-Transmitting Disease . . . And the Manifestation of Phloem Symptoms In Certain Varieties of Citrus Relatives and Hybrids

Introduction

Cachexia, derived from two Greek words, kakos (bad) and hexis (condition), refers to the symptoms of malnutrition and wasting characteristic of affected citrus trees of those varieties that are highly susceptible to, or that readily express symptoms of, the disease of that name. The trouble was first brought to our attention in 1945 when affected Orlando tangelo trees were found near Clearwater, Florida (2). A few plantings of this variety are free of the disease, but in others (sometimes on the same property) 1 to 60 percent of the trees may be diseased. That certain trees are diseased may become noticeable within two years from planting, because of their lack of vigor, chlorotic foliage, and other symptoms. If no symptoms have appeared by the time a tree is five years of age (from planting date) it seems to remain free of cachexia indefinitely, indicating that the disease is seldom spread from tree to tree in a grove.

Symptoms of the Disease

The symptoms described here refer specifically to the Orlando tangelo. On other varieties and species of citrus the symptoms may or may not be as sharply defined.

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BUREAU OF PLANT INDUSTRY,
SOILS AND AGRICULTURAL
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STATE HORTICULTURAL SOCIETY

Phloem Discoloration:—Discoloration of the inner bark, or phloem, through gum impregnation is a characteristic and diagnostic symptom of cachexia. In order to observe the gum-impregnated phloem tissues, it is necessary to cut away the outer bark at the bud union boundary. Discoloration commences just above the bud union and in the early stages may consist of no more than a series of small brown spots along the scion-rootstock boundary, but in five or six year old trees the phloem may be discolored 18 inches or more above the union. Discoloration has not been observed below the union when the rootstock is Rough lemon, Cleopatra mandarin, Rusk Citrange, grapefruit, or sweet orange, but when the rootstock is Orlando tangelo phloem discoloration also appears below the union.

Wood pitting:—When the bark of a diseased Orlando tangelo is peeled off at the bud union the exposed wood is found to be in-

dented or pitted in a very characteristic manner. The inner (cambial) surface of the removed bark is marked by lumps and projections that coincide with and fit into the depressions in the wood. Below the union, the wood and the inner surface of the bark of Rough lemon and other symptomless rootstocks are smooth and normal to all appearances.

Bark cankers:—The occurrence of bark cankers on the Orlando tangelo above the bud union and occasionally on the branches may constitute a more conspicuous symptom than phloem discoloration or wood pitting, from the grower's standpoint. Bark cankers, like phloem symptoms and wood pitting, do not develop below the union when the rootstock is Rough lemon, Cleopatra mandarin, or other symptomless variety. In some respects the bark cankers resemble bark lesions caused by foot rot *Phytophthora citrophthora*, but all attempts to culture *Phytophthora* from the advancing margin of these cankers have been unsuccessful (2).

Stunting and chlorosis:—Affected trees are usually severely stunted and often severely defoliated. Frequently, the leaves are chlorotic,

(Continued on page 8)

Federal Government Issues Important Citrus Document

Following up the work and investigations of a special congressional committee on the research and marketing activities of the United States Department of Agriculture, the Citrus Fruit Advisory Committee has made a detailed and exhaustive report on these investigations as they affect the citrus industry. The report covers production, utilization, disease control, marketing and in short every phase of the industry. The information contained should be of value to everyone engaged in any capacity in the citrus industry.

The members of the Citrus Fruit Advisory Committee include F. R. Wilcox, Chairman; A. Vernon Saurman, Vice Chairman; Stanley B. Crockett, L. V. Eberhard, Earl R. French, L. S. Hamme, W. K. McCracken, J. J. Parrish, Raymond D. Robinson, Charles A. Rogers and Robbins Russel.

The Committee has reviewed the present program of research and related services in the U. S. Department of Agriculture in the light of the national emergency and the defense effort. As an indication of the food value and importance of citrus, it was pointed out that in World War II the military took a substantial part of the production through set-aside orders, the National School Lunch Program included it as an important part of the lunch, the British Government used it in their infant feeding program. Citrus was listed as one of the items used in making up the Bureau of Labor Statistics index and was generally recommended by medical and human nutrition specialists of our country for its health protection qualities.

The Committee recognizes the great value of basic fundamental research in developing the present industry and emphasizes that it now faces many serious problems in the fields of production, utilization and marketing that need the results of research for their solution. They strongly recommended, therefore, that agricultural research be maintained at least at the present level of financial support. Unless rising material and labor costs can be checked, the present level

will mean a marked reduction in the amount of research work that can be done.

The Citrus Fruit Advisory Committee now feels that the Production, Utilization and Marketing divisions of research on citrus are of equal importance. The production of citrus is faced with major threats from the Oriental fruitfly, the Mexican blackfly and the Tristeza disease, any one of which could ruin the industry should it become epidemic in the major producing areas.

Utilization research needs to give increased attention to developing more concentrated products that can be stored at room temperature without marked loss of food value in order to economize on critical materials and on transportation, merchandising facilities and manpower. More attention also needs to be given to attaining greater efficiency and lower costs in processing citrus products.

The citrus industry faces the problem of marketing a greatly increased volume of citrus fruit within the next few years as a result of the rapidly expanding acreage in Florida. The present national emergency, by focusing attention on the production of certain basic foods and commodities, should not divert attention from the fact that marketing of fresh citrus and citrus products is a major concern of the industry. The rapid growth of frozen citrus juice concentrate has raised a number of new problems on which the industry desperately needs help through research.

Feeling that its advice would be most helpful to the Department of Agriculture if given on broad fields or categories of work, the Committee has arranged them in order of priority in each of the main divisions of Production, Utilization and Marketing. It also has made recommendations concerning certain kinds of work under some of the classifications.

Production

1. Control of Diseases and Insects, and Testing Rootstocks.

Citrus Diseases. The threat of the Tristeza disease is probably the most important at this time. Every

available resource should be used to prevent its introduction into areas where it is not now present, and to reduce its rate of spread or to control it in infested areas.

Testing Rootstocks. The work of determining the reaction of numerous rootstocks to the Tristeza disease in Brazil was commended highly, and it was recommended that testing these same rootstocks in this country should be expanded to include a study of factors affecting dormancy and cold resistance as soon as possible in addition to testing for resistance to Foot Rot, Rio Grande Gummosis, Cotton Root Rot, nematodes, salt, boron and chlorosis.

Insects and Insecticides. Particular attention should be paid to the survey and control work relating to Mexican blackfly and Oriental fruitfly as these insects threaten the continued existence of the citrus industry. More attention should be directed to the development of biological methods of control, and an immediate study of the insect situation in Texas was urged. The importance of continuing commodity treatments for elimination of Mexican blackfly, Oriental fruitfly and other fruit flies was reaffirmed.

2. Improved Yield and Quality Through Better Fruit Set and Plant Nutrition.

Better Quality. With the increased emphasis being given interior quality by all sectors of the trade, it was urged that the fundamental studies on the effect of mineral element balance in the plant on interior and exterior fruit quality be accelerated and expanded as soon as possible.

3. Better Varieties Through Introduction and Breeding.

Breeding for Specific Use. The rapid growth of the citrus processing industry has focused attention upon the urgent need for varieties with high soluble solids content, better interior color, superior flavor and ripening over a long period, and it was recommended that varieties possessing these characteristics be introduced or bred from plant material already in this country. There is also a need by the fresh

fruit trade for high dessert quality fruit that will extend the present marketing season.

4. Nematodes as Limiting Factors in Production.

Extend Surveys. The committee expressed its desire that the survey and control work on nematodes as limiting factors in citrus production be initiated in all major producing areas and carried out as rapidly as possible.

5. Irrigation of Citrus. (Continuation of work recommended).

6. Development of Improved Machinery equipment.

7. Control of Weeds.

Utilization

In the utilization field it was felt that the major emphasis should be put on basic or fundamental work that would lead to:

1. Improvement of Quality of Processed Products.

Higher Concentration. In view of possible shortages of container materials and conservation of transportation and distribution facilities during the national emergency, it was felt that studies should be made of how high the concentration of both frozen and hot-pack juices could be carried and still maintain acceptable quality.

2. Maintenance of Quality.

3. Development of New Uses for Citrus and Citrus Products as Food.

Institutional Recipes. The work on developing large quantity recipes for institutional and school lunch programs was commended and its continuance urged as an effective means of increasing consumption.

Citrus Juice Powders. It was recommended that if further research on citrus powders is needed, it be supported by funds other than those of the Department of Agriculture.

Pink and Red Grapefruit. An increased program of research on the utilization of pink and red-fleshed grapefruit was recommended.

4. By Product and Residue Utilization and Waste Disposal.

Marketing

In the field of marketing, the Committee recommended that the following categories be given high priority:

Consumer Purchase and Retail Store Availability. They strongly urged the continuation of the consumer purchase and retail store availability studies, pledged their continued financial support, and pointed out that the results obtained in the early years will become more valuable for prediction

purposes as the series is lengthened, and that its continuance is very desirable in view of the rapidly changing citrus marketing picture and the value of the data in making related price and demand studies.

Foreign Production, Competition and Demand. The committee again stressed the importance of keeping in touch with the traditional foreign markets for citrus fruit and citrus products in new areas and a study of the competitive fruit and products from other producing areas should be continued. They were gratified to learn of the plans for making a study of the Mexican citrus industry.

Transportation Equipment, Services and Rates. The citrus group was pleased with the tests on shipping frozen concentrate in railroad cars and trucks and recommended that tests be instituted next year on shipping fresh tangerines to distant markets.

Quality Preservation in Marketing Channels. Early initiation of commercial scale tests of some of the more promising chemicals for control of fruit rots was recommended. The report on cold storage of oranges was praised and it was recommended that the work be continued with grapefruit and lemons.

Improving Merchandising Methods and Practices. The committee was unanimous in praising the work under contract on training retailers in improved methods of merchandising and in favoring its continuance. The Department was commended for the excellence of the report on Coordinated Marketing of Florida Citrus and recommended that the problem be given continued study.

Effect of Frozen Concentrates. In view of the lack of progress due to manpower shortage on the study of the influence of frozen concentrated citrus juices on the price structure and marketing practices for canned citrus juices and fresh citrus fruits, it was suggested that the possibility of contracting with some non-government institution be explored as the results of such a study are urgently needed by the industry.

Reduction of Handling Costs. In determining the kinds of equipment that will cut handling costs it was suggested that the major emphasis be placed on the most efficient method of using equipment now on hand in view of the possible shortage of new equipment.

Marketing Education by Extension Service. The Committee complimented the progress made by the Federal Extension Service in the development of a program for working with the states on the training of retailers in the merchandising of agricultural products and urged that the program be expanded as rapidly as possible.

Regional Marketing Programs. It was recommended that cost data be continued on packing fresh fruit and the processing of citrus fruit, and that more attention should be given to the problem of obtaining cost data at the wholesale and retail levels.

Categories given middle priority include: Improving market news, grade standards and inspection, improvement of market facilities, state marketing service programs; and in the low priority classification were: Improving crop estimates and reports, consumer preference studies; marketing margins and costs; improving containers, packaging and loading.

GRADE STANDARDS FOR

FROZEN CONCENTRATED

CITRUS JUICE BLEND

The U. S. Department of Agriculture recently announced the issuance, for the first time, of U. S. standards for grades of frozen concentrated blended grapefruit juice and orange juice. The standards became effective December 9.

These standards supplement grade standards for other frozen citrus juice concentrates. The technical requirements are based upon a "3 plus 1" concentrate which require three parts of water to be added to one part of concentrate for beverage use.

Essential features of the standards are a recommended blend that will yield not less than 50 percent orange juice in the reconstituted juice (but may be as high as 75 percent if oranges producing very light colored juice are used); two styles—one with and one without sweetening ingredients; and requirements for a balanced relation of sweetness to acidity.

Scoring factors for color, flavor, and absence of defects are provided for the grades of U. S. Grade A (or U. S. Fancy) and U. S. Grade B (or U. S. Choice).

Using kerosene to build a fire is a very dangerous practice that often results in tragedy.

CACHEXIA . . . A BUD-TRANSMITTED DISEASE AND THE MANIFESTATION OF PHLOEM SYMPTOMS IN CERTAIN VARIETIES OF CITRUS, CITRUS RELATIVES AND HYBRIDS.

(Continued from page 5)

especially along the midrib. These are typical starvation symptoms such as occur when a tree is ringed or girdled and indicate that the flow of nutrients has been impeded in some manner. An application of fertilizer may stimulate a flush of new green leaves on diseased trees but these leaves soon become chlorotic.

Bud Transmission Studies

It is often possible to recognize the phloem symptoms of cachexia the first year after Orlando tangelo trees are set out; so it seemed possible that the trees may have been infected when they were set out, possibly through the buds. An experiment to test sources of budwood was started in 1947 (2) in which Rough lemon seedlings, 210 in number, and 90 Orlando tangelo seedlings were set out for use as rootstocks in lots of thirty each.

Buds from several sources were inserted in the Rough lemon seedlings as follows: (a) Buds from Orlando tangelo trees affected with cachexia disease, as determined by presence of discolored phloem, were inserted in three lots of seedlings. (b) Buds from healthy Orlando tangelo trees, as determined by the absence of phloem discoloration and generally vigorous appearance, were inserted in four lots of seedlings. All the Rough lemon stocks were cut back to the bud in the spring of 1948.

A number of Rough lemon rooted grapefruit trees that had been topworked to Orlando tangelo were found in 1949. Although the buds were from healthy trees, most of the Orlando scions showed symptoms of cachexia. In 1950 buds from sprouts on the grapefruit interstocks were inserted in one lot of healthy Orlando tangelo budded trees.

The 90 Orlando tangelo seedlings were budded in 1947 as follows: 30 with diseased Orlando buds, 30 with healthy Orlando buds, and 30 were left as unbudded checks. None of the Orlando stocks were cut back.

In February 1951 the first phloem discoloration was found and immediately all trees in the experiment were examined for that symptom. In the three lots of diseased

Orlando buds on Rough lemon root, 40 of the 54 scions that survived, or 74.1 percent, expressed phloem symptoms (3). Each diseased tree represents an instance of cachexia transmission from a separate tree source. Seventy-one of healthy Orlando tangelo buds on Rough lemon rootstock survived and none of the trees from these buds showed phloem symptoms (3). Here also each tree represents a bud from a separate tree source.

In that portion of the experiment in which Orlando tangelo seedlings were used as rootstocks, 27 of the buds from diseased parent

trees survived and 25 (92.6%) showed phloem symptoms at the bud union. The discoloration appeared equally marked on the Orlando scion above the union and on the Orlando stock below it. In the case of the healthy Orlando tangelo buds on Orlando rootstocks none of the 28 surviving scions showed phloem discoloration, and none of the unbudded seedlings showed symptoms. This indicates that cachexia can be transferred from tree to tree through the budwood and also shows the importance of selecting budwood from cachexia-free trees for propagation

Table 1. Phloem symptoms of cachexia (xyloporosis) in 59 varieties of citrus, citrus relative, and hybrids as rootstocks

Rootstock Group and variety	Number examined	Number with symptoms
Sour orange (<i>Citrus aurantium</i>)		
Sour No. 2 (laboratory)	29	0
Oklawaha	25	0
Bergamia	29	0
Sauvage	27	0
Bittersweet	25	0
Natsu Mikan	6	0
Sweet orange (<i>C. sinensis</i>)		
Florida sweet seedling	21	0
Hamlin	27	0
Grapefruit (<i>C. paradisi</i>)		
Duncan	27	0
Leonardy	27	1*
Pummelo and shaddock (<i>C. grandis</i>)		
Almoen	12	0
Ogami	10	0
Siamese	24	0
Thong Dee	27	0
Cuban shaddock	27	0
Lemon (<i>C. limon</i>) hybrid		
Iran	11	0
Rough	27	0
Lime (<i>C. aurantifolia</i>) hybrid		
Kalpi	31	0
Rangpur	25	0
Mandarin (<i>C. reticulata</i>)		
Cleopatra	25	0
Dancy	25	0
Sunki	28	0
King	25	0
Owari	2	0
Swatow	21	2
Clementine	27	8
Ponkan	7	1
Poncirus trifoliata		
Small flowered	25	0
Large flowered	6	0
Kumquat		
Nagami (<i>Fortunella margarita</i>)	12	6
Tangelo (<i>C. paradisi</i> x <i>C. reticulata</i>)		
Sampson	29	0
Watt	31	0
Webber	2	0
Williams	29	2
Suwannee	24	5
Orlando	32	23
Sunshine	30	15
Pina	28	3
Thornton	23	4
Yalaha	25	7
Minneola	27	4
Seminole	8	8
Wekiwa	13	9
Citrumelo (<i>C. trifoliata</i> x <i>C. paradisi</i>)		
Savage	4	0
Saunders	4	0
C-1425	8	0
Morton	21	0
Rustic	7	0
Citrumelo P. trifoliata x C. paradisi)		
C-4475	25	0
C-4561	6	0
Citrangor ([P. trifoliata x C. sinensis] x C. sinensis)		
C-42681	8	0
Citrangquat ([P. trifoliata x C. sinensis] x Fortunella)		
C-48032	10	0
Limequat (<i>Fortunella japonica</i> x <i>C. aurantifolia</i>)		
Lakeland	31	23
Tavares	16	2
Tangor (<i>C. reticulata</i> x <i>C. sinensis</i>)		
C-653	31	0
Umatilla	21	1
Temple	21	2
Lempum (<i>C. limon</i> x <i>C. grandis</i>)	6	0
Calamondin (<i>C. reticulata</i> x <i>Fortunella</i>)	25	1

*It is suspected that the infected rootstock was not Leonardy.

purposes.

Unfortunately very few of the grapefruit buds that had been inserted in the Rough lemon stocks below healthy Orlando scions survived, because of the unusually hot weather at the time of budding. However, 7.7 percent of the Orlando scions expressed phloem symptoms of cachexia within the short period of two years. The grapefruit interstocks were the presumed source of the disease in this instance but even if they were not, the evidence indicates that grapefruit trees can harbor the disease and could therefore become symptomless carriers.

Phloem Symptoms in Certain Varieties of Citrus and Citrus Relatives

Although originally not intended to be part of the research on cachexia disease, extensive rootstock experiments set up in 1948 in Florida and Texas have yielded important information on the expression of cachexia symptoms by varieties other than Orlando tangelo and on symptomless carriers. These plantings consisted of seedlings of a number of citrus varieties and a few citrus relatives budded with two standard varieties of sweet orange (Valencia and Pope Summer) in Florida and one variety of grapefruit (Red Blush) in Texas. Although an effort was made to secure psorosis-free buds of Red Blush grapefruit, it was subsequently discovered on the basis of leaf symptoms that some of the bud sources were diseased. In March 1951 E. O. Olson reported in a private communication to the author that rootstocks of Orlando tangelo and Temple orange in the Texas planting showed the phloem discoloration and wood pitting symptoms of cachexia. Upon examination of the other stocks in the experiment he found eleven other citrus varieties and hybrids with cachexia symptoms (9).

As a result of the information from Texas, three rootstock plantings in Florida were examined in June 1951 and the results are presented in table 1. It is evident that the buds used in these rootstock trials were not all infected with cachexia from the fact that but 72 percent of the Orlando tangelo stocks and but 50 percent of the Sunshine tangelo stocks were affected (table 1). Hence some of the rootstocks replicated only a few times may have escaped inoculation.

However, in most instances sufficient replicates of a variety and

sufficient varieties of a species or hybrid were examined to give a clear picture of symptom expression. It can be seen that three of the eight mandarin varieties showed phloem discoloration as did the one kumquat variety. Symptoms were also expressed in the mandarin hybrids such as tangelos and tangors and in the kumquat hybrids such as Calamondin and limequat. The two varieties of sweet orange and the two varieties of grapefruit did not show cachexia symptoms although sweet orange and grapefruit have been found to carry the disease. Nor were symptoms found on the six varieties of sour orange, five varieties of pummelo, two varieties (probably hybrids) of lemon, or the two varieties of *Poncirus trifoliata*. The hybrids in which both parents are symptomless such as citrange, citrumelo, citrangor did not show phloem discolorations. The one citrangequat in the test expressed no symptoms but other citrangequats might react differently.

The rootstock experiments in Florida and Texas (9) give further evidence that sweet orange and grapefruit trees can harbor and transmit cachexia through buds from trees that show no phloem discoloration or wood pitting symptoms.

Relation to Other Diseases

Xyloporosis:—The symptoms described for xyloporosis disease of sweet lime rootstocks in Palestine (10) and Brazil (8) are strikingly similar if not identical with those of cachexia (2) in Florida. Attempts to obtain specimens for comparison from the Palestine area were unsuccessful, but through the kindness of A. S. Costa specimens of Bahia Navel orange on Lima da Persia (sweet lime) affected with xyloporosis were obtained from Brazil. These specimens, preserved in alcohol-acetic acid-formaldehyde solution, showed the typical pitting of the cambial surface and the typical annular deposits of gum, visible on the exposed surfaces of radial sections of the sweet lime wood, as described by Reichert and Perlberger (10). After careful study it was concluded that the symptoms of xyloporosis on sweet lime exactly duplicate in all respects the symptoms of cachexia on Orlando tangelo (3).

Tristeza:—On the basis of wood-pitting symptoms McClean (7) suggested that xyloporosis on sweet lime may be related to the aphid-transmitted, wood-pitting virus dis-

ease of grapefruit in South Africa and that this last disease is the same as tristeza in South America. Costa, Grant, and Moreira (4) showed that, on the basis of insect transmission and the expression of leaf symptoms, tristeza and the aphid-transmitted, wood-pitting disease of grapefruit are the same or closely related, but they pointed out that, on the basis of differential host reactions, tristeza and xyloporosis are separate and distinct diseases (6). Our studies on symptom expression suggest that certain mandarins are injured by cachexia as is indicated by gum impregnation of the phloem tissues and other symptoms; but these same mandarins were found by Grant, Costa and Moreira (5) to be extremely tolerant of the tristeza virus. Also, cachexia infected sweet orange buds from two sources in Florida and grapefruit buds from one source in Texas (3) grew vigorously on six different sour orange rootstocks; this is certainly contrary to the observed reaction of tristeza-infected citrus trees of these varieties on sour orange stock (1, 5, 11).

Summary and Conclusions

Cachexia has been transmitted many times under controlled conditions by means of buds taken from trees with typical symptoms of the disease. At the same time and under the same cultural conditions trees propagated from budwood of healthy trees did not show symptoms. Seedling Orlando tangelo trees were inoculated with cachexia by means of budwood from diseased trees but, growing in close proximity, unbudded Orlando seedlings and those budded with healthy buds remained healthy, indicating no natural spread from tree to tree within the experiment.

The rootstock experiments in Florida and in Texas showed that cachexia may cause gum impregnation and discoloration of the phloem, characteristic of cachexia, in varieties other than the Orlando tangelo. These varieties are principally the mandarins and kumquats and hybrids of either of these.

Evidence is presented that (sweet orange and grapefruit) two species of citrus that do not express symptoms may harbor cachexia, becoming in effect symptomless carriers of the causal agent of the disease. Budding from such trees onto seedlings of varieties that readily express symptoms, such as the Orlando tangelo, has shown the causal

(Continued on page 21)

Citrus Production Report

As of December 1, 1951...

FLORIDA

CITRUS—November weather conditions have in general been favorable for citrus development. Below normal temperatures for the first three weeks aided ripening processes. Little rain fell in the citrus areas the first two weeks of November, but 2-4 inches fell the third week, relieving a temporary drought condition. First sizes this year are generally smaller than last year.

The harvesting of fruit continues active but has not reached 1950 proportions. By the 1st of December nearly 7 million boxes of oranges, 5 million boxes of grapefruit and 600,000 boxes of tangerines had moved into utilization channels. This compares with 8.4 million boxes of oranges, 6.0 million boxes of grapefruit and 400,000 boxes of tangerines to December 1, 1950. This year processors have used 2.9 million boxes of oranges and 1.4 million boxes of grapefruit, compared with December 1, 1950—3.8 million boxes of oranges and 2.5 million boxes of grapefruit.

UNITED STATES

CITRUS—Early and mid-season oranges for the 1951-52 season are estimated at 56.1 million boxes—4 percent above last season and 21 percent above average. Valencia oranges for the U. S. are forecast at 61.2 million boxes—2 percent below last season but 16 percent above average. The total grapefruit crop is now indicated at 40.7 million boxes, 13 percent below last season and 20 percent below average. California lemons are forecast at 12.9 million boxes—4 percent less than last season but above average.

Citrus groves in **TEXAS** and **Louisiana** sustained extremely heavy damage from a freeze around the first of February this year and the commercial production for the 1951-52 season will be negligible. In Texas, growing conditions were favorable during November. Supplies of irrigation water were ample. The cold spell early in the month caused no damage to citrus. Most of this season's short crop will move during the Christmas season except for the small production of

J. C. TOWNSEND, JR.,

AGRICULTURE STATISTICIAN

Valencias which will not mature until later.

ARIZONA oranges are estimated at one million boxes and grapefruit at 2.8 million boxes—down a fourth and a tenth respectively from last season. Irrigation water continues short and trees have a light set of fruit.

CALIFORNIA weather during November was generally favorable for citrus crops. Santa Barbara, Ventura and San Diego counties received much needed rains. Fruit

sizes in southern counties are smaller than normal for this time of year. Navel and miscellaneous oranges are forecast at 15.4 million boxes and Valencias at 28 million—5 percent above and 8 percent below last season respectively. Grapefruit production is indicated at a total of 2.6 million boxes—3 percent below last season.

Freezing temperatures occurred in many citrus areas of California on December 9 and 10 and in addition the southern counties sustained severe winds. Any possible damage from these adverse conditions is not reflected in the present production forecasts which were made as of December 1.

PRODUCTION—(Thousand Boxes)

Crop and State	Average 1940-49	1949-50	1950-51	Indicated 1951-52
ORANGES—Early and Midseason				
FLORIDA	25,050	33,600	36,800	40,000
California	18,273	15,630	14,610	15,400
Texas	2,260	1,120	1,800	250
Arizona	466	585	650	425
Louisiana, all	308	360	300	50
5 STATES	46,358	51,295	54,160	56,125
VALENCIAS				
FLORIDA	21,020	24,900	30,500	32,500
California	29,923	26,230	30,500	28,000
Texas	1,356	640	900	100
Arizona	439	400	750	600
4 STATES	52,738	52,170	62,650	61,200
TANGERINES				
FLORIDA	3,890	5,000	4,800	5,000
GRAPEFRUIT				
FLORIDA, ALL	27,280	24,200	33,200	35,000
Seedless	11,730	11,200	15,800	16,500
Other	15,550	13,000	17,400	18,500
California, Desert Valley	1,155	1,060	1,160	1,140
Texas	17,387	6,400	7,500	250
Arizona	3,294	3,400	3,150	2,800
4 STATES	49,116	35,060	45,010	39,190
LIMES				
FLORIDA	184	260	280	260

INTEREST IN CLOTHING

Because of high clothing prices, Broward county home demonstration club members are showing increasing interest in selection, construction, sewing, care, renovation, and

remodelling of clothing, according to Miss Louise Taylor, home agent.

Heptachlor, a relatively new insecticide, is among the insecticides recommended to control boll weevils.

What Do You Know About pH?

Most farmers realize the extensive contributions made by the science of chemistry to our understanding of soil fertility. Among other things, a knowledge of soil chemistry has made it possible to correct undesirable acid conditions where these exist in the soil.

The need for lime to combat soil acids and to supply calcium to acid soils has been recognized for many years. In the early days, however, before chemists had learned how to measure the acid condition of a soil, the use of lime was frequently attended by unsatisfactory results. These disappointing experiences were often the result of using too much lime, or of using lime when it was not needed at all. Difficulties of this kind were largely the result of an incomplete knowledge of soil chemistry. In 1910, chemists simply did not know how to measure soil acidity. Lacking this basic information, earlier agricultural workers found it difficult to decide which soils needed lime, how much to apply, and how to measure the results achieved.

This brings us to the principal subject of our discussion, namely, an explanation of how chemists specify the exact degree of acidity possessed by a soil. In the past, attempts have been made to state the results of a soil acidity test in simple words that were supposed to be easily understood without any special knowledge of chemistry. Thus, one might say that a certain

RICHARD A. CARRIGAN
BIOCHEMIST, DEPT. OF SOILS,
FLORIDA AGRICULTURAL EXPERI-
MENT STATION, GAINESVILLE

soil had been tested and found to be strongly acid, moderately acid, weakly acid, or even neutral, but these attempts at simplification were unsatisfactory even for non-technical people. What was needed was a scale of numbers that could be used to specify in a precise manner the exact degree of acidity as determined by the laboratory.

By the time adequate methods for measuring soil acidity had been developed, chemists were already using what is known as the pH scale for this purpose. The term "pH" is thus the chemist's symbol for indicating a particular degree of acidity.

The scale of pH numbers runs from about zero to approximately 14; the lower the pH the stronger the acid. Although we are concerned primarily with soils, the pH system of describing the strength of acids also supplies to any material of which water is the chief component. It will, therefore, be convenient to list the pH values of some familiar watery solutions by way of helping to form some idea of the meaning of these numbers. We will not try to present a scientific definition of pH since this

is unnecessary and would require an involved technical discussion.

By way of illustration, we can begin with a familiar acid, for example, muriatic acid. This material is a typical strong acid; it is powerful enough to dissolve limestone and is very corrosive to human skin. It has a pH value in the neighborhood of zero, thus illustrating the point that strong acids have very low pH values.

Going up the pH scale, we may take lemon juice as an example of a somewhat weaker acid with a pH of about 2. Proceeding to even weaker acids, the pH value of tomato juice is likely to be about 4.

Ordinary distilled water in contact with air will contain a trace of carbonic acid, though the acidity is so extremely weak as to be undetectable to the taste. The pH in this case will be in the neighborhood of 6.

Absolutely pure water, free of any acid whatever, has a pH value of exactly 7. A pH of 7, therefore, represents the neutral point of the pH scale, since water is neither an acid nor an alkali.

Some materials have the ability to destroy acids and are said to be alkaline. The presence of such an alkali is indicated by a pH value greater than 7. For example, a very weak alkali like agricultural limestone, may give a pH value of about 8 when in contact with water and air. A very powerful alkali, such as ordinary lye,

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may have a pH value near 14, the approximate upper limit of the pH scale.

When we apply the pH scale to soils we find that very few of them are more acid than pH 4, though many of the flatwoods soils of Florida have pH values between 4 and 4.5 and are thus quite acid, as soils go. In the absence of marl or limestone, muck and peat soils are often quite acid, with pH values below 5.

In the native state, the sandy ridge soils of Florida are typically less acid than flatwoods soils, with pH values ranging from about 5 to about 6.5. Under certain conditions of cultivation these soils become more acid, the pH eventually falling below 5. This trend is reversed in practice by applying ground limestone or dolomite but this must be done in a controlled manner or damage may result. In citrus groves, for example, the grower should avoid adding so much limestone that the pH rises above 6.

In this connection the pH scale of measuring acidity has proved of immense value. Before chemists had applied this method to soils, it happened in many cases that too much lime was used, resulting in pH values considerably in excess of 6 with consequent severe injury to trees. Following these disastrous experiences, growers tended to blame their difficulties on the lime. As a matter of fact, some lime was needed; the real cause of trouble was the lack of a method for determining the degree of soil acidity and controlling the addition of lime to avoid a harmful excess.

A slightly acid condition in the soil is desirable for most crops and many cultivated soils are found to have pH values between 5.5 and 6.5. Marl soils, however, are alkaline and tend to have pH values near 8. For reasons not well understood, these high pH levels in natural marl soils are not always as harmful as an equal degree of alkalinity would be in an originally acid soil which had been overlimed to pH 8. Nevertheless, some difficulties are encountered because of the high pH levels of marl soil.

Space does not permit a discussion of detailed liming recommendations for soils. However, any grower may obtain information concerning suitable practices by consulting his local county agent,

Sufficient chemical fertilizer for use during the coming year will not be available to meet all demands. So farmers are urged to order and store all that they expect to need.

This suggestion was made by Russell Coleman, president, The National Fertilizer Association, who pointed to Secretary Brannan's recent statement that: "We are looking on fertilizers as the principal key for accelerating immediate production and improving soils for sustained production at high levels."

Warning of the anticipated shortage is based upon expectations that fertilizer demands will be the greatest in history. Total production

will probably be up at least 1 percent with nitrogen output increased 5 percent and potash output up 5 percent from 1951. However, superphosphate production may decline 10 percent, because of unprecedented priority demands for sulfur and sulfuric acid by defense industries. Hence farmers are warned that in some areas they may be unable to secure the exact types of fertilizer they want, and they may be unable to obtain their full requirements.

The wise farmer will order now and store his fertilizer. He can do this satisfactorily by following these simple precautions:

- (1) Store fertilizer in a dry place where there is little variation in temperature;
- (2) Pile fertilizer no higher than 5 or 6 bags;
- (3) Never pile the fertilizer on the ground or even a concrete floor—the ideal storage place is an elevated wooden platform.

Your Trees Deserve The Best

They need the best of care and the best of fertilization in order that they may produce the amount and the Quality of fruit necessary to provide each grower with returns that will justify his investment of money, time and effort. We sincerely believe that Florida Favorite Fertilizers can provide you with just this sort of service as they have done for hundreds of other growers throughout the state.

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Costs and Competition Widen Activities of Co-Op Processors

Cooperative fruit and vegetable processors are finding it necessary to assume some of the functions, such as advertising and warehousing, formerly assumed by wholesalers, according to a study by the U. S. Department of Agriculture. This shift results from the efforts of wholesalers to reduce their operating costs to meet competition of the bigger stores which may deal directly with the processor. As the marketing practices of cooperative and other fruit and vegetable processors are similar, much of the report should be of interest to other processors, as well as to cooperatives.

The study, a preliminary report on a Research and Marketing Act project, was made by the Cooperative Research and Service Division of the Farm Credit Administration. It is published as Miscellaneous Report 151, "Marketing Canned Fruits and Vegetables Processed by Cooperatives, 1948-49."

The report, based on a detailed analysis of the sales of 27 cooperative associations, is supplemented by information from brokers representing these associations in 19 important primary markets.

A large share of the sales of the cooperatives studied were made to wholesale grocers who purchased in 1948-49 about 45 percent of the totals. Chain stores and super markets accounted for 27 percent. Sales to independent retailers amounted to less than 1 percent. Sales to the Government, other processors, institutions, and consumers amounted to around 25 percent, and about 2 percent went to other buyers.

A major portion of the canned fruits and vegetables, except citrus, sold by the cooperatives studied, was marketed under buyers' labels. The cooperatives used brokers rather generally in distributing their product. About three-fourths of the sales of canned noncitrus fruits and vegetables and three-fifths of the canned citrus juices and segments were made through brokers.

Spuds Johnson says it is better to regret delay than to deplore poor judgment.

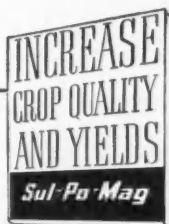
USDA SETS UP EXPORT PROGRAM FOR ORANGES

An export program designed to encourage exports of fresh and processed oranges went into effect December 15, it has been announced by the U. S. Department of Agriculture.

The program is designed to help market this year's record crop of oranges.

The program provides for payments up to 40 percent of the export sales prices, basis f. a. s. United States ports, to be limited by the maximum rates established for individual products. It is similar to programs in effect during the past three years.

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CITRUS AND VEGETABLES BOTH NEED MAGNESIUM

Many Florida growers who have observed the increased yields and quality of citrus fertilized with soluble magnesium are now using it with equally good results with vegetables. Most leading fertilizer manufacturers are supplying plant foods containing *Sul-Po-Mag* for use on vegetable crops. *Sul-Po-Mag* is a properly balanced combination of magnesium and potash, both in soluble form and immediately available to growing crops. Use it regularly for more healthy crop growth and more profitable yields.



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Inspection Of Fresh Fruits And Vegetables Reaches New High

Federal and Federal-State inspection of fresh fruits and vegetables reached a record total of 1,334,678 carloads (carload equivalent) during the year ended June 30, 1951, the U. S. Department of Agriculture announced recently. This is an increase of 100,000 carloads over last year.

The inspection work at terminal markets is conducted by the Fruit and Vegetable Branch, Production and Marketing Administration, and at shipping points is done under cooperative agreements between the Branch and each of the 48 states and Hawaii. During the year, 71 offices doing market inspection were in operation, including new offices recently opened at Charleston, S. C., Shreveport, La., and Savannah, Georgia.

The most important development in inspection work at terminal markets was the large increase in volume of inspections for the armed services and for public and private institutions. During the year nearly a billion pounds of fresh fruits and vegetables were inspected for the Navy, Marine Corps, and Quartermaster Corps.

Commercial inspections at shipping points increased 34,606 cars over 1950 for a total of 816,555 cars. In addition, inspection of farmers' stock peanuts increased from 74,995 cars in 1950 to 79,546 for 1951. Inspection for compliance under surplus removal programs amounted to 2,909,904 bushels of apples, 79,417 bushels of sweetpotatoes, 24,000 packages of cabbage, and 17,400 bushels of topped beets. Under export payment programs, 2,347,050 bushels of apples, 365,967 bushels of pears, 2,049,423 of oranges, and 250,390 boxes of grapefruit were certified. A total of 764 cars of potatoes, broccoli, and corn in 4 states were certified under consumer grades.

One of the more important types of inspection, which directly serves the producers, is the inspection, at country points, of raw products for processing. In this type of inspection, the producer brings his product to the inspection stations and the inspector appraises the product in terms of U. S. Stand-

ards, or on a contract specification with a buyer who purchases on the basis of the inspection certificate. This type of work, conducted in practically all States during the past fiscal year, amounted to the equivalent of nearly 350,000 carloads. In New York State alone, 100,000 truckloads of growers' products were inspected on this basis.

In Louisiana, strawberries from the fields of 18,000 growers were certified for shipment to distant markets, and in North Carolina more than 2 million packages of fresh vegetables and strawberries were inspected for sale at country auctions. The shipping points service also offers inspection under consumer grades of family size packages.

In addition to the actual inspection work, the inspection service conducted 283 classes for the purpose of training new inspectors and held 340 meetings with growers, to acquaint them with Federal grades and the grading service, and with grower administrative committees for marketing orders and agreements. Also, 379 meetings were held with shippers to advise and help clarify inspection problems.

Fifty-four thousand schools over the nation participated in the school lunch program in 1950. More than a billion meals were served to pupils under the program.

Three Canners Organizations Unite

Consolidation of the activities of the three trade Associations serving the Florida Citrus Processing Industry was announced recently.

Effective January 1, 1951 the Florida Canners Association will take over the information services of the Canners League of Florida and will administer the program of the Citrus Processors Association, representing pulp and molasses producers.

Bert Livingston, who has been the League's secretary, will become the assistant of C. C. Rathbun, Executive Secretary of the Florida Canners Association, to handle its public relations program as well as publicity for the citrus pulp and molasses group.

Both the League and the Processors Association will retain their separate identities, though the League does not plan to maintain an office or staff and the Processors Association will handle all of its activities through the Tampa office of the Florida Canners Association.

"The consolidation of activities will reduce expense and will centralize the handling of the industry problems of the citrus canners, concentrators and by-products producers," said C. C. Rathbun, Executive Secretary of the Florida Canners Association.

NEW OPA LOCKA 4-H CLUB

A new 4-H club for boys has been organized at Opa Locka under the direction of J. L. Edwards, assistant Dade County agent.

For More Than Thirty Years

The Citrus Industry magazine has supplied Florida Growers with the most authentic information relative to Florida citrus production and other problems.

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\$1 for one year — \$2 for three years — \$3 for five years

Increased Use Of Farm Market News On Radio

More than 1,300 of the 2,200 radio stations in the United States are broadcasting Federal or Federal-State market news daily, according to a survey of all stations, the U. S. Department of Agriculture has announced. The survey, conducted annually by the U. S. Department of Agriculture for the past 30 years, was made to assist the Market News Services of the Department as a guide in securing effective dissemination of these reports and to answer inquiries from farmers and agricultural organizations as to what stations carry the various reports.

Of the 1,922 stations reporting, 1,312 present one or more market broadcasts daily. This is an increase of 12% over a year ago.

During 1921, first year of market news broadcasts, only three stations carried the reports.

The survey shows that 1,223 stations are regularly broadcasting reports on livestock and livestock products; 592 on fruits and vegetables; 633 on grain and feed; 932 on dairy and poultry; 288 on cotton; and 36 on tobacco.

In addition to the broadcasts over the standard band, 225 FM stations carried simultaneous broadcasts of market news on AM stations. Last year only 200 FM stations were carrying market news.

This year also marked the beginning of the use of farm market news by television on a regular basis. Five TV stations reported such programs, including WOIT-TV Ames, Iowa; WCPO-TV Cincinnati, Ohio; WTVN-TV Columbus, Ohio; WBNS-TV Columbus, Ohio; and WHIO-TV Dayton, Ohio.

Questionnaires were sent to radio

stations around April 1. This undoubtedly accounts for the relatively smaller number of stations carrying tobacco market news and evidence indicates the number of stations carrying cotton, and fruit and vegetable market news might be higher if the survey were made in the fall rather than in the spring months.

The Department of Agriculture's market news and area information offices each day prepare information on markets, food supplies and related agricultural programs for transmission by press associations to radio stations. Some market news broadcasts are also handled locally by USDA offices by remote control.

The principal use of market news is by farmers, shippers, and dealers. It is used in planning their over-all as well as day-to-day operations. Market reports provide basic information for many economic and statistical, and long and short range market studies. A main function of market news is to put producers of agricultural products on a more nearly equal bargaining basis with other segments of industry at the time of sale.

GROWERS' SHARE FOR VALENCIAS DECLINES WHEN PRICES ARE LOW

Growers of Valencia oranges in Florida in the four years 1945 through 1948 absorbed the entire decrease that occurred in retail prices of their fruit and also the increase that took place in marketing charges, according to results of a study published by the Bureau of Agricultural Economics, U. S. Department of Agriculture. The study indicates what can happen to the farmer's cash returns during a period when prices for what he has to sell drop and marketing costs stay up or increase.

During the 1949-50 season, however, the citrus price situation has improved. Big increases in the use of frozen concentrates together with somewhat smaller crops, because of freeze damage in other producing areas, have brought to Florida citrus growers more favorable returns.

Florida Valencia growers received about 17 cents of the consumer's dollar spent for oranges in eight major consuming markets from March through May 1948. This return was considerably less than half of the 43 cents they received in 1946, the report points out. Total marketing charges increased from 57 percent of the consumer's dollar in 1946 to 83 percent in 1948. The increase in the share going for marketing was due to the fact that retail prices for Valencias declined by 13 percent marketing charges actually increased.

From 1940 to 1948, costs of picking and assembling the fruit, which is the first step in the marketing process, increased 42 percent, according to the report.

The published report, "Grove-to-Retail Margins for Florida Valencia Oranges Marketed in Fresh Form in Selected Cities, 1940-48," was prepared by William C. Lilieholm, agricultural economist, Bureau of Agricultural Economics. The project was financed with Research and Marketing Act funds. Markets studied were New York, Philadelphia, Baltimore, Pittsburgh, Cleveland, Cincinnati, and Chicago.

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The Growers Own Page...

TO THE INDEPENDENT CITRUS GROWER OF FLORIDA:

There is a vast market for fresh fruit in this country which has not even been touched. There are thousands of people north of us waiting to taste the sweet tree-ripened juice from our citrus that we growers know is there. It doesn't get there because we have a law that prohibits us from shipping fruit that we are willing to have pass maturity tests right from our grove except by express. If we could roll the trucks north with our fruit and let them reach every little village and town there would be an immediate response from the housewives who are searching for such fruit.

But the housewives now are being turned against our fruit because it reaches them only after the processors have spoiled it by picking it immaturity, flooding the markets with washed and colored fruit that has lain around too long and the flavor of which has not a slight resemblance to that which we use ourselves. This is another form of racketocracy by the powerful interests. They do not want the shipping law changed, and you can see why by the prices which they are now paying you for your fruit.

Let your District representative of the Growers Administrative Committee know you want trucking out of state back again. Make sure that you know he knows. He will not try to help you but he cannot make this an excuse, "that he was not so instructed by the growers of his district" as the Vero Beach District representative stated at the first growers' attempt recently to get trucking back. The Growers Administrative Committee, appointed by the U. S. Secretary of Agriculture, can give trucking rights back to you if they have no other alternative by reason of growers' demands. Wake up! If you don't want to give your fruit away, do something about it.

A woman who attended the meeting in Lakeland on December 4, 1951.
Mrs. Ruth H. Holmes
Clermont, Florida

WANTS TO REACH NEW MARKETS

Barney Cohen, president of the

Florida Independent Citrus Growers Association, is a strong advocate of permitting citrus growers to ship their fruit by truck to nearby Southern markets without the necessity of passing the fruit through packing houses. In a letter to this publication he says, among other things:

"Shall the small citrus growers of the State of Florida permit the Cinderella of the industry (that is, the Concentrators) to become a vampire as evidenced in the closing forty-five days of the past citrus season, when growers were compelled to sell their citrus at 10 cents per box for grapefruit and 25 cents per box for their Valencias?

"Approximately 70% of the past season's Golden Sunshine Crop was put into cans. Hundreds of thousands of people in the Southern States in small communities did not have an opportunity to purchase fresh citrus fruit at a reasonable price.

"During the last session of the Legislature, a committee from our Association met with the Citrus Committee of the House of Representatives in order to amend the Citrus Code to simplify the movement of citrus from groves by truck, so that the fruit would not have to pass through a packing house at a cost of approximately \$1.50 per box.

"These trucks would haul fruit into areas of the Southern States which have not had the good fortune of buying good oranges for thirty-five cents a dozen and grapefruit for a nickel apiece; the same grapefruit which growers had to sell at ten cents per field box, consisting of about 70 grapefruit, receiving less than one cent for each grapefruit, while the same grapefruit were priced on the menu of the Duval Hotel in Tallahassee at 20 cents for 1/2 grapefruit.

"There must never be a repetition of what happened last season to hundreds of thousands of boxes of Tangerines, which were left hanging on the trees and finally dropped to the ground. There is relief within the State Citrus Code and the Federal Marketing Agreement for these Tangerine growers.

"In this era of scientific development and enlightenment, and with the

type of men in the State of Florida who are at the head of most of the important segments of the Citrus Industry, there is no need for any particular group to incur any loss, whether it be the citrus growers, the packers, the single strength canners, the concentrators, or any others who are a part of the big citrus family, which is about to move a crop in excess of one hundred and ten million boxes. This will mean at least one hundred and fifty million to two hundred million dollars in the economy of the citrus area. The difference of fifty cents per box on the tree to the grower, will mean the circulation of an additional fifty-five million dollars into the coffers of the business and professional men in this citrus belt.

"The growers should receive a minimum of \$1.50 per box on the tree for early oranges and \$1.75 per box on the tree for mid-season oranges. Duncan grapefruit should bring a minimum of \$1.25 per box on the tree and Marsh Seedless grapefruit \$1.50 per box on the tree.

"We need the concentrators, the single strength canners, the dispensing machines, the packers and every member of the citrus family who has made some contribution towards the progress we have made under the Federal Marketing Agreement and the New State Citrus Code, but it is in the interest of all to see that no member of the citrus family become a serf to any other segment of the industry.

"The more avenues of distribution for our citrus, the more consumers will enjoy the benefits of our production, and the better the returns to the small citrus growers of the State of Florida. Production costs for citrus have increased over 20%. Living costs have increased over 35%. It is high time that the returns to the small citrus growers of the State of Florida were commensurate with the returns of other commodities in our national economy."

Brooksville, Fla. — Three demonstration plots of clover — one of Kenland, two of crimson — have been planted near here this month, according to Harry J. Brinkley, Hernando county agent.

Governor Warren Sets Florida Citrus Week

The week of Feb. 18-23, set as the dates for the 1952 Florida Citrus Exposition will be designated as "Florida Citrus Week" in an official proclamation to be issued by Governor Fuller Warren from Tallahassee, he has informed the show officials.

The governor, at Winter Haven for a radio program, conferred with John A. Snively, Jr., president of the Exposition, and Phil E. Lucey, general manager, and gave his approval to plans for the all-industry citrus show.

It was announced by Snively that the Winter Haven Junior Chamber of Commerce would again sponsor the annual contest to select the Exposition queen and her court. A gigantic prize list, worth many thousands of dollars, will be given the queen and her court of six maids. The queen will be selected for her ability to meet people, to talk to groups during projected trips to the markets, as well as for personality, beauty and poise. Details of the contest will be announced within a short time.

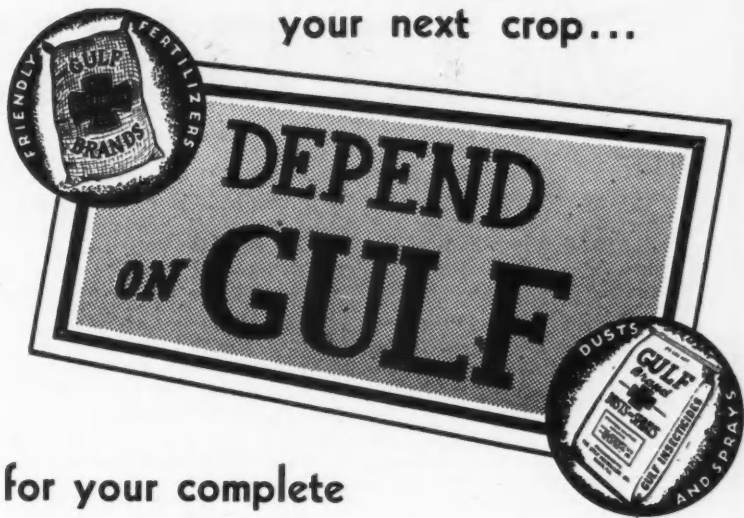
Lucey said that work on the animated exhibits, depicting the theme, "Alice in Orangeland," is well along towards completion and will be ready for the opening on Feb. 18. Many of the exhibits will be in animation.

Charlie Race, Winter Haven citrus man and manufacturer, and Al Davis, Chamber of Commerce manager, will have charge of the opening day parade on Monday, Feb. 18, and several floats and bands, as well as marching units, have been booked for the line of march.

The "Fresh Fruit Day" observance on Thursday, Feb. 21, will feature a real terminal fruit auction with Al P. Rightor, president of the Union Fruit Auction Co., of Pittsburgh, in charge. He will announce his committee appointments.

The Florida Citrus Museum, being established in the Florida Citrus Building, adjacent to the Exposition grounds, will open on Jan. 15 and will be available to Exposition visitors as an added attraction while the Tom Moore "Ladies Fair" radio show, on MBS, 11 a. m., Monday through Friday, which has started a 13-week series from Winter Haven will help to entertain the citrus show crowds.

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Department

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Reports Of Our Field Men . . .

POLK, HIGHLANDS & HARDEE COUNTIES

J. T. Griffiths

Some rain has continued to fall in Polk county and soil moisture conditions throughout this part of the citrus area are excellent. As a result of these rains, purple mite injury has been minimized. Many growers have been able to delay DN sprays until late December because of this moisture.

Some growers are planning to start their dormant spray application during the last week in December. They will be applying DN, Zinc and Wettable Sulphur. In a few instances Parathion will also be included as scale continues to be a problem in some groves.

Fruit drop has been severe particularly in pineapple, seedling and grapefruit blocks. This has been general throughout the entire area and no cause such as fertilization or spray program can be blamed for the condition in individual groves. Purple scale has been a major factor in most fruit drop.

SOUTH POLK, HIGHLANDS, HADREE & DeSOTO COUNTIES

C. R. Wingfield

The weather at the time of this writing (December 18) is very unsettled. Over the week-end there was a sudden drop in temperatures which at first appeared to be a threat to both citrus and vegetables down into the muck sections. Just as suddenly as it dropped it rose again without any appreciable damage.

Citrus has continued to flow into the markets in large quantities with the prices of fresh fruit fluctuating somewhat. There has been some hopes of higher prices after the Christmas holidays.

There are still some groves that have not been fertilized for one reason or another. It is rather late but the ground is still warm and with moisture conditions good the trees should assimilate plant food readily.

Fruit droppage has been somewhat alarming on some varieties.

WEST CENTRAL FLORIDA

J. E. Mickler

This past month marked the windup of most groves receiving fall applications of fertilizer. Rain

fall during the month has been enough that these applications are beginning to show up nicely. There has been some evidence of Purple Mites and DN applications seem to be favored. At this time prices are the principal concern of growers. It is a fervent hope of all that prices will come up.

Cattlemen in this section have counted blessings in that frost has spared most grasses, and rain has been enough to keep grasses in the green stage. Fall fertilizer programs on pastures have had good conditions to aid the overall plan. Cattle on fertilized grass have shown definitely the need for more extensive fertilizer programs in that these cattle are in markedly better condition.

SOUTHWEST FLORIDA

Eaves Allison

Fruit movement from this area is still slow at this time, Dec. 17th, and will no doubt stay that way until after the Christmas halt in buying which usually comes at this point.

Vegetables have been making out at unusually high prices especially the crops of tomatoes, cukes, peppers and egg plant. Squash is just now coming down into the unprofitable range. Crops are not heavy and quality is only fair, due to the early season difficulties with rain and cold.

Gladiolus prices are down with good supplies of high grade flowers in sight and on the market. The cooler weather of mid-December will slow up the cut and no doubt reflect favorably in the market.

As we again come into a new year this company extends it very best wishes to all of our friends.

PASCO AND EAST HILLSBOROUGH COUNTIES

E. A. McCartney

We have had rain enough in the past 10 days to do groves and pastures a lot of good. Melon land being prepared for planting will be in good condition to work.

There is a lot of dropping of early and midseason oranges due to Blue Mold which is brought about by weather conditions. This is especially serious in seedling oranges. Prices are still very unsatisfactory. Groves are in fine shape and should

put on another good crop next spring where reasonable attention is given to them.

Berries in the Plant City section have started to move to the market. Vegetable growers in Sumter and Hillsborough counties have made their plans for the spring crop and are going ahead with their operations.

The growers are producing the citrus and vegetables even with the prices always an uncertainty, because they are still optimists.

NORTH CENTRAL FLORIDA

V. E. Bourland

Weather has been fine, but has been very dry and the recent rain was very welcome. Fruit has been moving rather fast, but we have had more drops this year than in any year I can remember. Looks like Nature will pro rate things itself, if dropping is prevalent over the state as it is here.

Red Spider and rust mite have been working very badly. Most of the groves have been fertilized or cultivated, young trees banked, fence rows and ditch banks cleaned up.

Cabbage are looking good, and still more acreage is being set in cabbage. The prices are good.

PINELLAS COUNTY

T. D. Watson

We are continuing to have excellent seasoning with another rain over the past week end. No one complains particularly about weather conditions but all are complaining about early fruit market conditions.

There are still great quantities of early fruit in my territory that will conflict with midseason oranges. For the past week I have noticed more movement of early fruit than heretofore and hope that it continues to move for at least a small profit, if not better.

Watermelon growers have started putting out fertilizer in hopes of getting an early start. With ideal moisture they should get an early stand. Melon planting is going to be about the same acreage as last year. There shouldn't be too much market conflict if Hillsborough and Pinellas counties can get off to an early start.

Here's hoping that an increase in citrus prices is forthcoming which would give all of us a Better Christmas and a Happier New Year.



Uncle Bill Says:

We ain't too good at expressing ourselves, but we don't want to let this occasion pass without tellin' everyone of the many fine growers whose patronage has made this company successful that we are mighty appreciative of their business and to hope for them and theirs a New Year full of the richest blessings in happiness and success.

With the new year just startin' most of us will sort of stop and figure out how we can profit by our mistakes in former years so that we can profit mentally and materially throughout the year 1952.

We ain't near smart enough to tell you how to make your personal life happier . . . that's a job for each individual . . . but we're smart enough to know that every grower should keep his groves in tip-top shape if'n he wants to stave off as much as possible the attacks of insects and weather, and so they'll grow the biggest possible crops of Finest Quality fruit.

One thing is for sure, if prices are low the feller with the most fruit of the finest quality is the guy who'll get the top of the market for his offerings, and if prices happen to be good he'll profit just that much more for the same reason.

And for our money the surest way to get this kind of fruit is to make use of the fine fertilizers which are manufactured by the Lyons Fertilizer Company.

Then, too, we'd like to add the comment that while we've tried in the past to render every possible service to our customers, we've never stopped and don't intend to stop now, tryin' to improve that service.

If you've got problems pertainin' to producin' or most anything else connected with the raisin' of good citrus we've got some folks that have come up with some mighty good answers to other folks problems. Maybe they could help with yours. They'd sure be glad to give you the benefit of their counsel.

Fifty Years Of Improvement In Fruits And Vegetables

Fifty years of research in the improvement of fruits, vegetables, nuts and ornamentals have brought almost unbelievable changes to these crops, a plant scientist of the U. S. Department of Agriculture reports.

Dr. J. R. Magness of the Bureau of Plant Industry, Soils and Agricultural Engineering, speaking at the Bureau's Golden Jubilee celebration, contrasted production of these crops at the turn of the century with that of the present. Then, fruits and vegetables were grown on general farms near big centers of population. Farmers had only the crudest methods of controlling diseases and insects. There were severe losses from brown rot of peaches, black rot of grapes, San Jose scale, and bitter rot of apples. For fruit in the winter, people depended largely on home canned goods or dried fruits from California. There was little commercial canning. Only 10 million boxes of citrus fruits were produced annually. Now production exceeds 150 million boxes. Very few winter vegetables were shipped from the South. Fresh vegetables for winter were forced under glass. There was very little refrigeration for storing perishables.

Reviewing the changes that Bureau research has brought to horticultural crops, Dr. Magness said disease control, in its infancy when the Bureau was established in 1901, has made great strides. These have come in the development of highly effective organic fungicides and insecticides and in better equipment for applying them. New knowledge of plant diseases, particularly viruses which were unknown in 1901, is also resulting in more widespread controls.

Since the Bureau's inception, plant breeding has been directed to the development of disease resistant varieties with heavy yields, of uniform size and color, and with increased vitamin content.

Notable gains include: A technique for producing hybrid onions; a demonstration of the importance of fruit thinning and the development of chemical sprays for this purpose; the use of growth regulators to make apples, pears, and to some extent citrus fruit, stick on

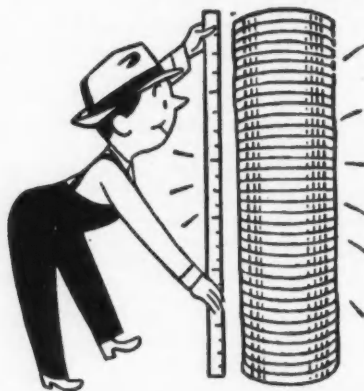
the tree until the grower is ready to pick it.

Bureau scientists have had a hand in either the development or evaluation of almost every change in the methods of handling and shipping fruits and vegetables over the past 50 years. Among other contributions, the findings have led to

wide adoption of precooling as a standard practice in the shipment of highly perishable products.

Commenting on need for future research, Dr. Magness said, "We have made only a minor start on the development of disease resistance in fruits. We have little resistance to many vegetable diseases and even less to nematodes and insects. As our industries become more highly mechanized, new problems arise, and in some cases new varieties must be developed to meet the requirements of mechanization."

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CACHEXIA . . . A BUD-TRANSMITTED DISEASE AND THE MANIFESTATION OF PHLOEM SYMPTOMS IN CERTAIN VARIETIES OF CITRUS, CITRUS RELATIVES AND HYBRIDS.

(Continued from page 7)

agent of cachexia to be present in symptomless varieties. Establishment of known sources of healthy budwood would appear to be one of the important means of control of this disease.

A comparison of the described symptoms and examination of wood specimens of both diseases indicate that cachexia and xyloporosis are the same disease.

A comparison of the host relationships of cachexia (xyloporosis) and tristeza presents additional evidence that they are separate and distinct diseases.

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USDA ANNOUNCES ORANGE EXPORT PROGRAM:

The U. S. Department of Agriculture made effective on December 15 an export payment program designed to encourage exports of fresh and processed oranges.

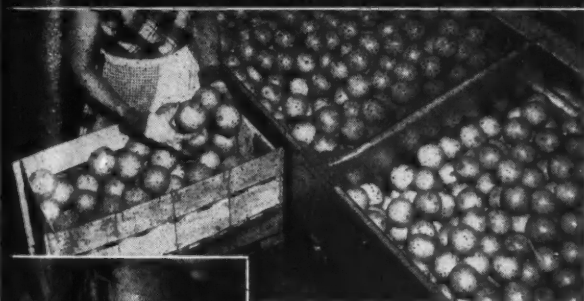
The program provides for payments up to 40 percent of the export sales price, basis f.a.s. United States ports, to be limited by the maximum rates established for individual products, and is similar to programs which were in effect during the past three years. Payments will be made from funds authorized by Congress to encourage exports of agricultural commodities.

Purpose of the program is to help market this year's record crop of oranges.

Eligible outlets include ECA countries in Europe (other than citrus producing countries) the Republic of the Philippines, the Republic of Indonesia, the Federation of Malaya, Hong Kong, and Singapore.

Announcements containing full details of the program are now being mailed to exporters and members of the citrus industry.

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